[redacted]

STAT

Ref: 552-OD-223

17 November 1964

STAT [redacted]

Projects 552 & 552A
Progress Report, October 1964

Gentlemen,

Enclosed are three (3) copies each of [redacted] STAT Progress Report on Projects 552 and 552A for the period October 1964. Also, attached is "Customer Evaluation" Report.

Very truly yours,

STAT [redacted]

Vice President - Marketing

RJL/de

Encl: (3) P.R. - 3 pp.
(3) Att. I

STAT

PROGRESS REPORT

For

VERSATILE, HIGH PRECISION STEREO

POINT TRANSFER DEVICE

Period Covered:	October 1964
Dated:	16 November 1964
Job No.:	#552 and #552A
Document No.:	OD-221

PROGRESS REPORT
For
VERSATILE, HIGH PRECISION STEREO
POINT TRANSFER DEVICE

OBJECTIVE ASSEMBLY

Wiring of objective assemblies is nearly complete, delayed by wiring revisions in other circuit areas. Once wired, both assemblies will be ready for installation. Laser optics are completely installed on the sub-assemblies.

Filters for cleaning laser cooling air have been located, and will be evaluated in November.

The beamsplitter, used to get the laser beam into the visual optical system, appears to color the field more towards the green than estimated. The estimated brightness is about 30% less than the 552A viewers, and is the result of compromising laser path efficiency to that of the visible path.

Film samples are still needed for laser film marking evaluation.

EYEPIECE ASSEMBLY

Because the higher gear ratio on the eyepiece angular adjustment of the operator's motion limit sense has been diminished to a point where gearbox can be easily overloaded and damaged, a positive stop mechanism is being added to handwheel shaft so that positive limit control is obtained.

Work has been done to carefully guide the fiber cable through the motions of the eyepiece and objective assemblies. We advise that an operator should take precaution when tilting and translating the eyepiece assembly, or in moving the equipment, to make certain fiber optics cable does not get forcibly bent, especially if viewer is backed against a wall with less than 2 feet clearance.

VACUUM FILM HOLDDOWN SYSTEM

New platens appear to work well, requiring occasional recycling of "Release" and "Hold" modes to remove remaining air pockets under film. Some corrections are in work, and platens will be on viewer early in November.

MANUAL FILM DRIVE

Braking circuit appears to have a useful low speed threshold of operation. Switches have been added at spool drive housings to free spools for manual and automatic threading.

WIRING

Scan drive circuitry required a significant change which meant adding two (2) large multipole relays for rewiring of the control panel. This work is now under way. Wiring of control cabinet is nearing completion. Main instrument console is awaiting tie-in to objective assemblies.

JOY STICK

Assembly and wiring are complete. The previous mechanical adjustment has been refined, and is being incorporated into the mechanism. Partial rewiring is necessary to make final mechanical adjustments.

STAT

#552 - OD-221

Work to be Completed

1. Complete development work on point marking system
2. Complete wiring and electrical debugging
3. Complete all mechanical assemblies
4. Get system debugging underway
5. Up-date schematics and wiring diagrams

ATTACHMENT 1 to #552 - OD-221

16 November 1964
WWB:rf

CUSTOMER EVALUATION

OPTICS

Dot Reticle

a) Correct flare, color and focus. We will paint 3M Black Velvet to reduce internal reflections.

b) Will adding diffusion help? We will try diffusing at condenser lens.

c) Center on cable axis of rotation, field stop center. We will readjust cable axis and dot projector axis.

Objective Lenses, Assembly

a) Noticed extremely small clearance below 7x lens. We will lower manifold 1/32 inch minimum.

b) Noticed turret and/or mount of 7x quite shaky. We will inspect components for proper adjustments.

c) Color and distortion at field edges 7x lens. These aberrations are a property of high power eye lenses used and larger aperture objective lens that is essential for light gathering capabilies. Suggest use of 4.5x eye lens.

d) All objective lenses must be focusable by operator. We will leave lens locking set screws semi-tight so that operator can adjust lens focus.

e) Suggested lock on field lens and baffle tubes. We will use Glyptol or Loctite to tighten barrels.

f) Dirt in field - possibly on field lenses. We will clean optics.

g) Right enhancer noisey and does not synchronize. We cleaned bearings and adjusted belt tension. Noise and synchronized voltage now lowered.

h) Zoom magnifier apparently coasts too much. We have installed a dynamic braking circuit that damps coasting to approximately .2x, or less, magnification change.

i) Distortion of low power lens. Distortion cannot be reduced unless field lenses are removed. Because field lenses are not in image plane they add power and, therefore, distortion. Use of a lower power, 4.5x eyelens reduced some of the distortion observed.

Eyepiece Assembly

a) Buzzer needed for Ø limit indication. In place of buzzer which would not directly prevent overtravel, we have installed a multiturn mechanism on gearbox input giving a positive turns limit.

b) Interpupillary scale numbers not clearly visible through port. We have made the hole larger.

c) Brightness across exit not uniform. We have made the headrest operational to control operator's eye position.

d) Headrest blocks interpupillary adjustment. We have made appropriate clearances.

e) Paint inside eyelenses with 3M Black Velvet. We have painted inside diameters of lens barrels.

f) Arrows on panel for direction of knob rotation. We have added arrows at extremes of 4 stations.

g) Baffle around eyelenses to block out stray light. We have added rubber baffle around eyelens station.

h) Larger handle on gear box. We have added larger handwheel.

Scanning Drives

a) Left channel (X) to center - out intermittently. We have completely revised adjustment scheme of joystick to assure reliable operation of all switches, potentiometers and linkages.

b) Left "Y" drive noisey - is motor damaged? We have checked motor for damage, correct wiring of electronics and proper adjustment of the mechanism. Noise still remains. All motors appear to make similar noises, but at different speeds.

ATTACHMENT I to #552 - OD-221

Joy Stick

a) Does not null occasionally - all axis on left scans continue to operate. We have revised adjustment procedure to assure proper operation.

b) Intermittent Y motion - perhaps micro switches at null cutoff not being energized? Same action as for a).

Circuitry - Miscellaneous

a) Blew 28V fuse - was fixed. Screw in joy stick shorting barrier. We are using the proper screws.

b) Counters operate during film movement, zoom adjustment and objective lens change. We have taken several measures to damp noise at sources and make counter electronics, more insensitive to other than desired signals.

c) Cooling of control cabinet required. We have added large perforated panels to aid convection cooling.

d) Film threading - cannot release brakes, both sides when automatically threading. We have added switches at each drive mechanism to turn off brakes during manual and automatic film threading.

e) Film transport jammed up occasionally. We have tightened the sprocket on the generator and adjusted the chain.

f) Orientation of joy stick is 180 degrees out. We have rewired the joy stick potentiometers.

g) Get limit switch orientated properly. We have adjusted the switches.

h) Loop formed in "Hold" film holddown position. We have added extra pole to "Form" switch to permits circuit isolation.

Vacuum Holddown

a) Air pressure at manifold. We will adjust pressure switch that will allow air to enter manifolds.

b) Leak right rear manifold. We have repaired and lowered the rear manifolds.

ATTACHMENT I to #552 - OD-221

c) Left format conked out several times. We have corrected a leak in the left front manifold.

d) Vacuum pump could be quieter. We have added more sound condition material to panels.

e) Switch for vacuum pump near operator. We will not relocate switch.

f) Attempt to lower manifold height. We have reduced the height by 1/32 inch.

Illumination

a) General measurement - 800 to 900 foot-lamberts thought to be a low value. We will check the circuit.

b) High intensity not measured, although color temperature to be 3400 degrees K minimum. We have provided filters to bring apparent color up to specification. These will reduce the light output, depending on which filter is selected.